Apprenticeship and Industry Training

Concrete Finisher

Apprenticeship Course Outline

4814 (2014)

Alberta

Apprenticeship and Industry Training

ALBERTA ENTERPRISE AND ADVANCED EDUCATION

Concrete Finisher: apprenticeship course outline

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Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Concrete Finisher Provincial Apprenticeship Committee.

The graduate of the Concrete Finisher apprenticeship program is a certified journeyperson who will be able to:

- perform tests to confirm concrete quality
- interpret building codes, plans and specifications as they apply to the trade
- place and finish concrete in a professional manner
- cut, patch, maintain and repair concrete structures
- perform assigned tasks in accordance with quality and production standards required by industry

Apprenticeship and Industry Training System

Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - standards and requirements for training and certification in their trade
    - courses and examinations in their trade
    - apprenticeship and certification
    - designation of trades and occupations
    - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

Concrete Finisher PAC Members at the Time of Publication

Mr. A. Aronson	Calgary	Presiding Officer
Mr. P. Cools	Irricana	Employer
Mr. M. Hrehoruk	Edmonton	Employer
Mr. N. Dodds	Okotoks	Employee
Mr. D. Ossevorth	Canmore	Employee

Alberta Government

Alberta Advanced Education works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board (board) fully supports safe learning and working environments and emphasizes the importance of safety awareness and education throughout apprenticeship training- in both on-the- job training and technical training. The board also recognizes that safety awareness and education begins on the first day of on-the-job training and thereby is the initial and ongoing responsibility of the employer and the apprentice as required under workplace health and safety training. However the board encourages that safe workplace behaviour is modeled not only during on-the-job training but also during all aspects of technical training, in particular, shop or lab instruction. Therefore the board recognizes that safety awareness and training in apprenticeship technical training reinforces, but does not replace, employer safety training that is required under workplace health and safety legislation.

The board has established a policy with respect to safety awareness and training:

> **The board promotes and supports safe workplaces, which embody a culture of safety for all apprentices, employers and employees. Employer required safety training is the responsibility of the employer and the apprentice, as required under legislation other than the *Apprenticeship and Industry Training Act.***

The board's complete document on its 'Apprenticeship Safety Training Policy' is available at www.tradesecrets.alberta.ca; access the website and conduct a search for 'safety training policy'.

Implementation of the policy includes three common safety learning outcomes and objectives for all trade course outlines. These common learning outcomes ensure that each course outline utilizes common language consistent with workplace health and safety terminology. Under the title of 'Standard Workplace Safety', this first section of each trade course outline enables the delivery of generic safety training; technical training providers will provide trade specific examples related to the content delivery of course outline safety training.

Occupational Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Occupational Health and Safety (a division of Alberta Human Services) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.humanservicesalberta.ca

Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Concrete Finisher apprenticeship technical training:

Southern Alberta Institute of Technology (Mayland Heights Campus)

Procedures for Recommending Revisions to the Course Outline

Advanced Education has prepared this course outline in partnership with the Concrete Finisher Provincial Apprenticeship Committee.

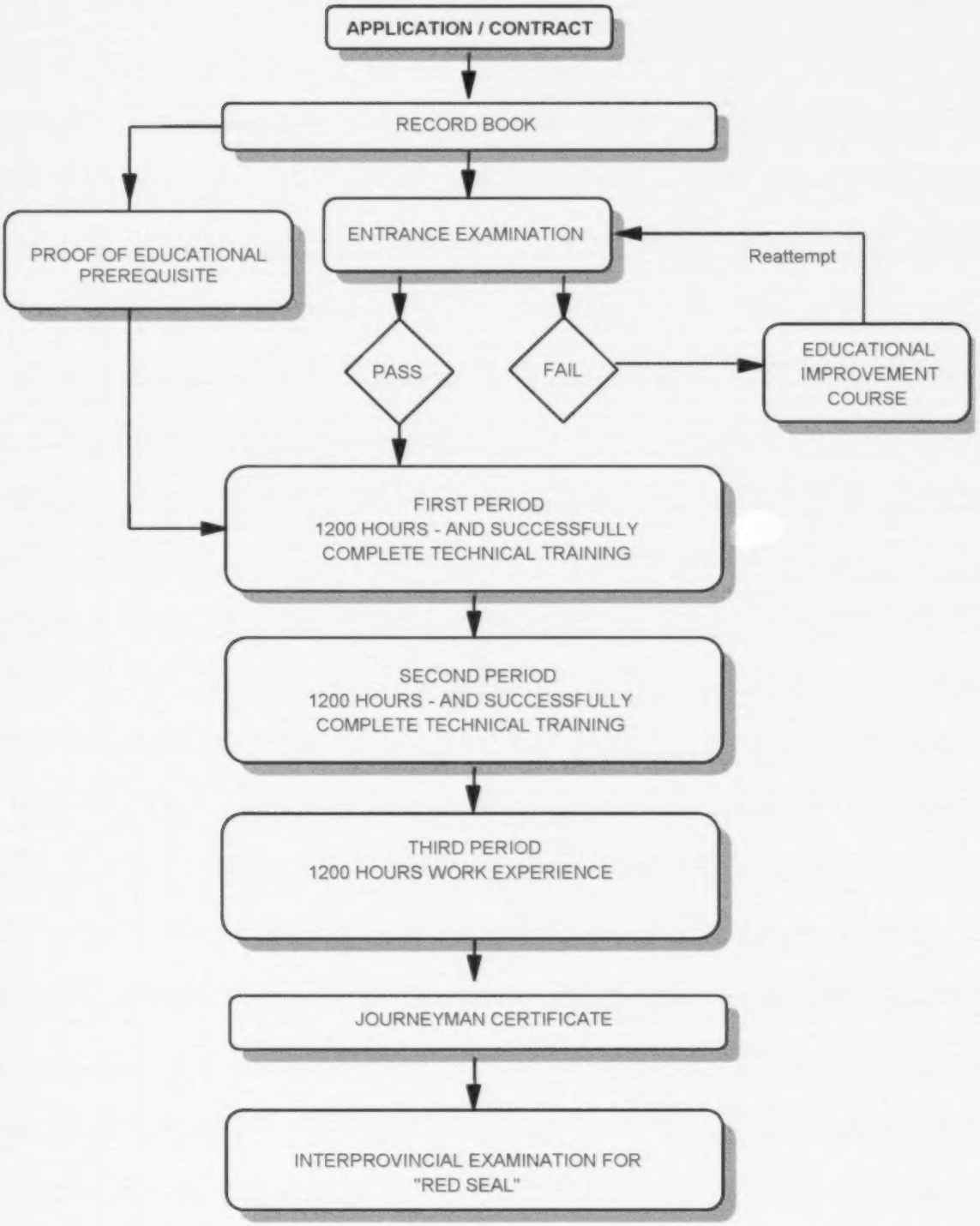
This course outline was approved on June 28, 2012 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Concrete Finisher Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education
10th floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Concrete Finisher Provincial Apprenticeship Committee.

Apprenticeship Route toward Certification



Concrete Finisher Training Profile
FIRST PERIOD
(4 Weeks 30 Hours per Week – Total of 120 Hours)

SECTION ONE

STANDARD WORKPLACE SAFETY & HAND AND POWER TOOLS

21 HOURS

A	B	C
Safety Legislation, Regulations & Industry Policy in the Trades – 4 Hours	Climbing, Lifting, Rigging and Hoisting – 3 Hours	Hazardous Materials & Fire Protection – 2 Hours
D	**E**	**F**
Measuring and Layout Tools – 3 Hours	Cutting, Assembling and Dismantling Tools – 1 Hour	Concrete Placing Tools – 1 Hour
G	**H**	**I**
Tools for the Surface Treatment of Concrete – 2 Hours	Mixing and Conveying Equipment – 2 Hours	Power Floats and Trowels – 3 Hours

SECTION TWO

CONCRETE

15 HOURS

A	B	C
Portland Cements – 6 Hours	Code Requirements – 2 Hours	Air Entrainment – 2 Hours
D	**E**	
Concrete Aggregates – 3 Hours	Transporting Concrete – 2 Hours	

SECTION THREE

CONCRETE PLACEMENT

15 HOURS

A	B
Placement of Concrete – 9 Hours	Sidewalk Project – 6 Hours

SECTION FOUR

CONCRETE PLACING, FINISHING AND CURING

33 HOURS

A	B	C
Concrete Finishing – 9 Hours	Concrete Joints – 5 Hours	Place and Finish Concrete (Project) – 12 Hours
D		
Concrete Curing Methods – 7 Hours		

SECTION FIVE

TRADE MATHEMATICS

21 HOURS

A	B	C
Introduction to Applied Mathematics – 2 Hours	S.I. Metric System – 2 Hours	Imperial System – 2 Hours
D	**E**	**F**
Lineal Measure – 2 Hours	Square Measure – 2 Hours	Cubic Measure – 2 Hours
G	**H**	
Calculating Ratio and Percentage – 2 Hours	Required Material – 7 Hours	

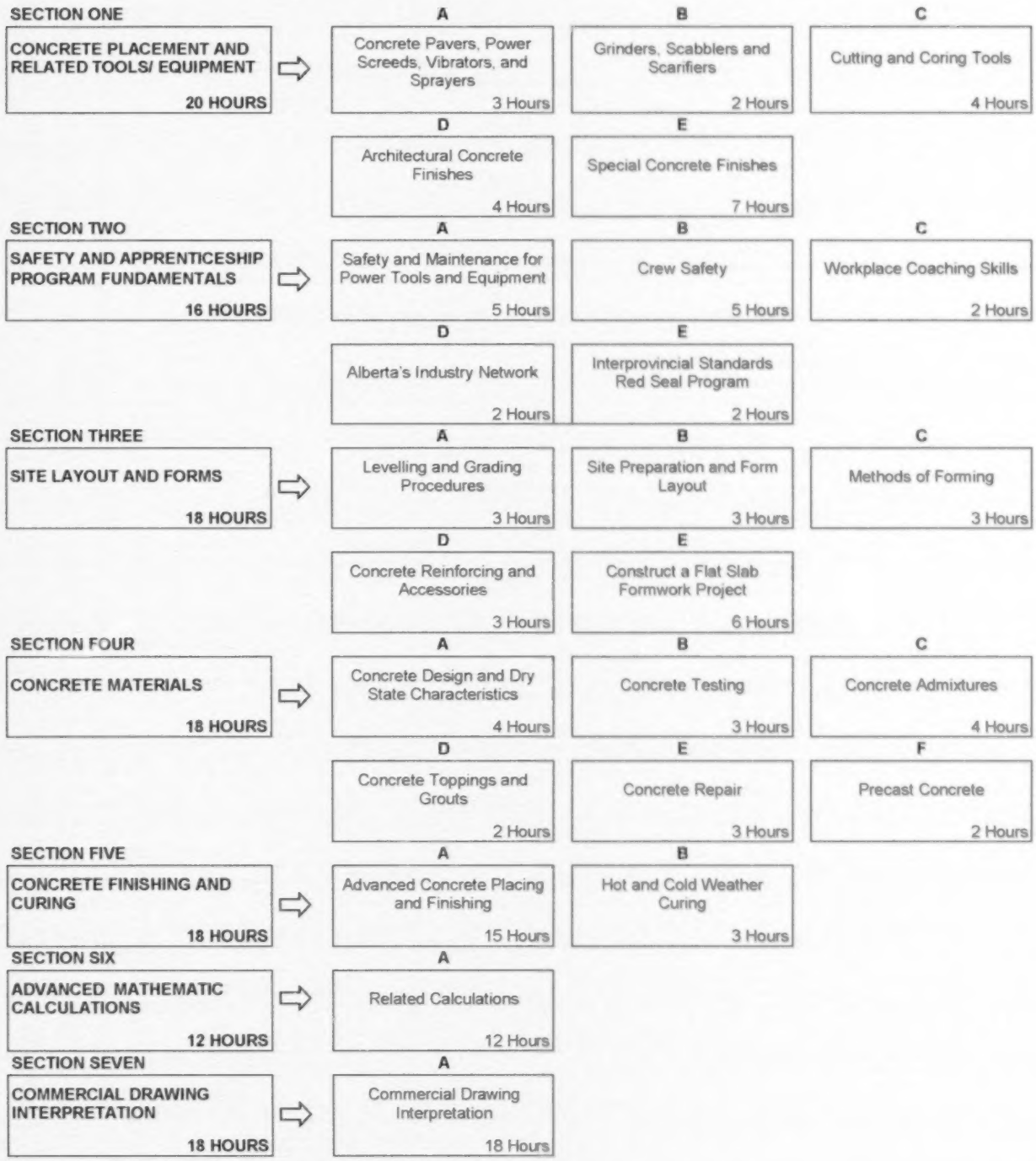
SECTION SIX

DRAWING INTERPRETATION

15 HOURS

A	B	C
Drafting Basics – 3 Hours	Drawing Standards – 2 Hours	Residential Drawing Interpretation – 10 Hours

Concrete Finisher Training Profile
Second Period
(4 Weeks 30 Hours per Week – Total of 120 Hours)



FIRST PERIOD TECHNICAL TRAINING
CONCRETE FINISHER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: .....STANDARD WORKPLACE SAFETY & HAND AND POWER TOOLS..... 21 HOURS

A. **Safety Legislation, Regulations & Industry Policy in the Trades .....4 Hours**

Outcome: ***Describe legislation, regulations and practices intended to ensure a safe work place in this trade.***

1. Demonstrate the ability to apply the Occupational Health and Safety Act, Regulation and Code.
2. Explain the role of the employer and employee in regard to Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations, and related advisory bodies and agencies.
3. Explain industry practices for hazard assessment and control procedures.
4. Describe the responsibilities of workers and employers to apply emergency procedures.
5. Describe positive tradesperson attitudes with respect to housekeeping, personal protective equipment and emergency procedures.
6. Describe the roles and responsibilities of employers and employees with respect to the selection and use of personal protective equipment (PPE).
7. Select, use and maintain appropriate PPE for worksite applications.

B. **Climbing, Lifting, Rigging and Hoisting ..... 3 Hours**

Outcome: ***Describe the use of personal protective equipment (PPE) and safe practices for climbing, lifting, rigging and hoisting in this trade.***

1. Select, use and maintain specialized PPE for climbing, lifting and load moving equipment.
2. Describe manual lifting procedures using correct body mechanics.
3. Describe rigging hardware and the safety factor associated with each item.
4. Select the correct equipment for rigging typical loads.
5. Describe hoisting and load moving procedures.

C. **Hazardous Materials & Fire Protection..... 2 Hours**

Outcome: ***Describe the safety practices for hazardous materials and fire protection in this trade.***

1. Describe the roles, responsibilities, features and practices related to the workplace hazardous materials information system (WHMIS) program.
2. Describe the three key elements of WHMIS.
3. Describe handling, storing and transporting procedures when dealing with hazardous material.
4. Describe safe venting procedures when working with hazardous materials.
5. Describe fire hazards, classes, procedures and equipment related to fire protection.

D. **Measuring and Layout Tools** ..... **3 Hours**

Outcome: ***Describe measuring and layout tools.***

1. Describe the use of measuring and marking tools.
2. Describe the use of hand levels, line level and plumb bob.
3. Describe the use of string lines, chalk lines and accessories.
4. Describe layout, aligning and squaring tools.

E. **Cutting Assembling and Dismantling Tools** ..... **1 Hour**

Outcome: ***Describe cutting assembling and dismantling tools.***

1. Describe the use of edge cutting tools.
2. Describe the use of assembling tools.
3. Identify different types, functions and applications of fasteners, adhesives and caulking commonly used in construction.
4. Describe the use of dismantling and demolition tools.
5. Describe the use of chipping and abrading tools.

F. **Concrete Placing Tools** ..... **1 Hour**

Outcome: ***Describe concrete placing tools.***

1. Describe conveying and distributing tools.
2. Describe vibrators and consolidating tools.

G. **Tools for the Surface Treatment of Concrete** ..... **2 Hours**

Outcome: ***Describe tools for the surface treatment of plastic concrete.***

1. Describe the use of floats and darbies.
2. Describe the use of trowels, edgers and jointers.
3. Describe the use of brushes and finishing brooms.
4. Describe clean up and maintenance procedures for hand tools.

H. **Mixing and Conveying Equipment** ..... **2 Hours**

Outcome: ***Describe mixing and conveying equipment.***

1. Describe types of concrete and grout mixers.
2. Describe the principles of mixing concrete.
3. Describe the principles of concrete transport.
4. Describe concrete conveying equipment.
5. Describe cleaning and maintenance of equipment.

I. **Power Floats and Trowels** ..... **3 Hours**

Outcome: ***Describe power floats and trowels.***

1. Describe the use of different types of power floats.
2. Describe the use of different types of power trowels.
3. Describe the safe operation and regular maintenance of power trowels.

SECTION TWO: ..... CONCRETE ..... 15 HOURS

A. **Portland Cements ..... 6 Hours**

Outcome: Describe Portland cement.

1. Describe the types and the classes of Portland cements.
2. Describe the applications for the different types of Portland cements.
3. Describe supplementary cementing materials.

B. **Code Requirements ..... 2 Hours**

Outcome: Interpret code requirements.

1. Interpret CSA- A23.1.2 and the National Building Code requirements for specific applications such as interior and exterior surface treatment.

C. **Air Entrainment ..... 2 Hours**

Outcome: Describe air entrainment.

1. Describe air entrainment admixtures and effects on concrete.
2. Describe the proper handling, placing and finishing of air entrained concrete.

D. **Concrete Aggregates ..... 3 Hours**

Outcome: Describe concrete aggregates.

1. Describe coarse aggregates.
2. Describe fine aggregates.
3. Describe the effect of aggregates on concrete for workability and performance.
4. Describe speciality aggregates for light and heavy weight concrete.

E. **Transporting Concrete ..... 2 Hours**

Outcome: Describe the transporting of concrete.

1. Describe knowledge of time restrictions and CSA requirements for transporting of concrete from supplier.
2. Describe concrete transporting and its effects on placement with reference to consolidation and integration
3. Describe the cause of segregation and the use of chutes, vibrators, tremies and pumps.

SECTION THREE: ..... CONCRETE PLACEMENT ..... 15 HOURS

A. **Placement of Concrete ..... 9 Hours**

Outcome: Describe the placement of concrete.

1. Identify site preparation (substrate) and its effect on the placement of concrete.
2. Describe the placement of concrete and its starting point.
3. Explain screeding to finish grade.
4. Describe the methods of consolidating concrete.

B. **Sidewalk Project** ..... **6 Hours**

Outcome: ***Construct a sidewalk project using a given specification.***

1. Layout a sidewalk using appropriate measuring and layout tools.
2. Prepare and construct forms for a sidewalk using appropriate cutting and fastening tools.
3. Place concrete in sidewalk forms using appropriate conveying, consolidating, and placing tools.
4. Perform surface treatment to achieve desired finish.
5. Perform proper curing using appropriate methods.

SECTION FOUR: ..... CONCRETE PLACING, FINISHING AND CURING ..... 33 HOURS

A. **Concrete Finishing** ..... **9 Hours**

Outcome: ***Describe concrete finishing.***

1. Identify surface treatments on plastic concrete.
2. Describe how to create various surface treatments by hand or power equipment such as pressure applications, angle of float and pattern of floating.
3. Describe how to finish extruded concrete surfaces such as curbs and gutters and sidewalks.

B. **Concrete Joints** ..... **5 Hours**

Outcome: ***Describe concrete joints.***

1. Compare the basic types of functional joints.
2. Attain knowledge of depth and joint placement.

C. **Place and Finish Concrete Project** ..... **12 Hours**

Outcome: ***Perform concrete placement.***

1. Layout for flat slab.
2. Prepare forms and set elevation for a concrete slab.
3. Place and consolidate concrete in slab forms.
4. Perform surface treatment to achieve a desired finish.
5. Place, consolidate and finish concrete stairs.

D. **Concrete Curing Methods** ..... **7 Hours**

Outcome: ***Describe curing methods.***

1. Explain the importance of curing to the hydration process.
2. Describe chemical cure.
3. Describe wet-cure.

SECTION FIVE: ..... TRADE MATHEMATICS ..... 21 HOURS

A. **Introduction to Applied Mathematics** ..... **2 Hours**

Outcome: ***Solve trade related math problems.***

1. Solve problems in rounding off numbers.

2. Solve whole number problems using single arithmetic principles.
3. Solve problems using combined arithmetic principles.

B. **S.I. Metric System** ..... **2 Hours**

Outcome: Calculate metric lengths, capacity and mass.

1. Apply the metric system to measuring lengths.
2. Apply the metric system to measuring capacity and mass.

C. **Imperial System** ..... **2 Hours**

Outcome: Calculate imperial math operations.

1. Apply the imperial system to measuring lengths.
2. Apply the imperial system to measuring capacity and weight.
3. Use fractions in addition, subtraction, multiplication and division.
4. Convert between fractions and decimals.

D. **Lineal Measure** ..... **2 Hours**

Outcome: Calculate lineal measure.

1. Use formulas to calculate perimeters and circumferences.
2. Apply the Pythagorean Theorem to right triangles problems.

E. **Square Measure** ..... **2 Hours**

Outcome: Calculate areas.

1. Correctly use formulas dealing with areas.

F. **Cubic Measure** ..... **2 Hours**

Outcome: Calculate Volume.

1. Correctly use formulas dealing with volumes.

G. **Calculating Ratio and Percentage** ..... **2 Hours**

Outcome: Calculate various problems involving ratio and percentages.

1. Convert between decimals and percentages.
2. Perform percentage calculations.
3. Perform ratio calculations.

H. **Calculate Required Material** ..... **7 Hours**

Outcome: Calculate required material.

1. Calculate material requirements for formwork.
2. Calculate concrete volumes for flat work and foundations.

SECTION SIX: .....DRAWING INTERPRETATION.....15 HOURS

A. Drafting Basics .....3 Hours

Outcome: Apply the use of basic drawing instruments.

1. Describe the functions of basic drawing instruments.
2. Use drafting equipment to complete geometric exercises.
3. Describe the applications of geometry in trade situations.
4. Practice producing shapes, angles and drawing to scale with the basic drafting instruments.

B. Drawing Standards .....2 Hours

Outcome: Develop a detailed trade related project.

1. Apply the line types used in orthographic drawings.
2. Demonstrate correct dimensioning methods and techniques.
3. Apply page layout and centering techniques.
4. Apply section and details and the use of material symbols.

C. Residential Drawing Interpretation .....10 Hours

Outcome: Interpret residential drawings.

1. Interpret a set of detailed residential drawings.
2. Interpret the foundation plan.
3. Interpret the floor plan.
4. Interpret the elevation.
5. Interpret sections and detail.
6. Interpret other trade responsibilities.

SECOND PERIOD TECHNICAL TRAINING
CONCRETE FINISHER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE:..... CONCRETE PLACEMENT AND RELATED TOOLS/ EQUIPMENT..... 20 HOURS

A. Concrete Pavers, Power Screeds, Vibrators and Sprayers .....3 Hours

Outcome: Describe concrete pavers, power screeds, vibrators and sprayers.

1. Describe the use of concrete paving equipment.
2. Describe the use of power screeds.
3. Describe the use of vibrators.
4. Describe the use of hand held pump sprayers.

B. Grinders, Scabblers and Scarifiers .....2 Hours

Outcome: Describe grinders, scabbers and scarifiers.

1. Describe the use of grinders.
2. Describe the use of scabblers.
3. Describe the use of scarifiers.

C. Cutting and Coring Tools .....4 Hours

Outcome: Describe cutting and coring tools.

1. Describe the tools, method and time to cut green and cured concrete.
2. Describe saw blades types used to cut green and cured concrete.
3. Describe the tools used to drill and core cured concrete.

D. Architectural Concrete Finishes .....4 Hours

Outcome: Describe architectural concrete and finishes.

1. Describe rubbed and floated finishes.
2. Describe parged and sack rub finishes.
3. Describe the use of white and coloured concrete.
4. Describe exposed aggregate finishes.
5. Describe the use of specialized stamped and decorative forming tools.
6. Describe how to achieve F_L and F_F floor levelness.

E. Special Concrete Finishes.....7 Hours

Outcome: Describe special concrete finishes.

1. Describe the dry shake pigment method of finishing concrete.
2. Describe surface hardeners and slip resistance.
3. Describe non-slip finishes.

4. Describe seeded exposed aggregate finishes.
5. Describe the use of epoxies.
6. Explain the application of polyurethane and polyester coatings.
7. Describe other specialty finishes.

SECTION TWO: ..... SAFETY AND APPRENTICESHIP PROGRAM FUNDAMENTALS ..... 16 HOURS

A. Safety and Maintenance for Power Tools and Equipment ..... 5 Hours

Outcome: Describe safety and maintenance practices for power tools and equipment.

1. Describe the safety and maintenance requirements of electrically operated tools.
2. Describe the safety and maintenance requirements of gasoline powered tools.
3. Describe the ventilation requirements for gasoline and diesel powered engines.
4. Describe the safe operation and maintenance requirements for pneumatic tools and compressors.

B. Crew Safety ..... 5 Hours

Outcome: Demonstrate the safety responsibility for leading a concrete finishing crew.

1. Describe the direct and indirect safety responsibilities for members of a crew.
2. Complete a hazard assessment and control procedure for a crew.

C. Workplace Coaching Skills ..... 2 Hours

Outcome: Display coaching skills.

1. Describe coaching skills used for training apprentices.

D. Alberta's Industry Network ..... 2 Hours

Outcome: Describe the role of the Alberta Apprenticeship and Industry Training Board and the network of industry committees that represent the trades and occupations in Alberta.

1. Describe Alberta's apprenticeship and industry training system.
2. Describe the roles and responsibilities of the Alberta Apprenticeship and Industry Training Board, government and post-secondary institutions.
3. Describe the roles and responsibilities of the PACs, LACs and occupational committees.

E. Interprovincial Standards Red Seal Program ..... 2 Hours

Outcome: Use Red Seal products to challenge an Interprovincial examination.

1. Identify Red Seal products used to develop Interprovincial examinations.
2. Use Red Seal products to prepare for an Interprovincial examination.

SECTION THREE: ..... SITE LAYOUT AND FORMS ..... 18 HOURS

A. Levelling and Grading Procedures ..... 3 Hours

Outcome: Describe levelling and grading procedures.

1. Describe zoning, bylaws and permits required before preparing site.

2. Describe how to obtain locations of utilities on a property.
3. Interpret soil analysis reports for slabs on grade.
4. Describe the procedures for cut and fill.
5. Apply knowledge of sub-grade compaction requirements.
6. Apply the ability to check uniformity of sub-base grade as specified.
7. Describe flowable fill and its uses.

B. Site Preparation and Form Layout ..... 3 Hours

Outcome: Describe site preparation and form layout.

1. Describe initial site procedures and requirements.
2. Describe form layout procedures.
3. Describe builders' levels: their parts, accessories and uses.
4. Transfer elevations using different set ups.
5. Describe cut and fill of grades or slopes.
6. Apply laser level setup procedures to transfer elevations.
7. Describe the use of hand levels, line levels and string line to determine elevations.

C. Methods of Forming ..... 3 Hours

Outcome: Describe methods of forming.

1. Describe formwork for structures such as slabs-on-grade and curbs and gutters.
2. Describe beam and girder form systems, and structural forming systems.
3. Describe the types of forces transmitted during placement of concrete.
4. Identify critical form areas to prevent failure.
5. Describe form watching with the ability to inspect bracing, shoring and supports.
6. Describe concrete stairs and forming methods.

D. Concrete Reinforcing and Accessories ..... 3 Hours

Outcome: Describe concrete reinforcing and accessories.

1. Describe the gauges and types of welded wire fabric.
2. Identify type and sizes of deformed bars.
3. Identify reinforcing placement for concrete stairs.
4. Describe various fibres and their application.
5. Apply the ability to check reinforcing placement as specified.

E. Construct a Flat Slab Formwork (Project) ..... 6 Hours

Outcome: Construct flat slab formwork.

1. Establish the bench mark.
2. Establish corners.
3. Erect batter boards.
4. Set edge forms to elevation.
5. Set screed stakes.

SECTION FOUR: ..... CONCRETE MATERIALS ..... 18 HOURS

A. Concrete Design and Dry State Characteristics ..... 4 Hours

Outcome: Describe concrete design and dry state characteristics.

1. Define normal and special purpose aggregates and how normal density aggregate quality is controlled.
2. Identify the range of compressive strengths of concrete design and the typical demands in industry.
3. Compare batching by weight and by volume.
4. Describe the hydration process and how to retain moisture.

B. Concrete Testing ..... 3 Hours

Outcome: Describe concrete testing.

1. Describe tests conducted on plastic concrete including air, slump and temperature.
2. Describe tests conducted on hardened concrete, including compressive, tensile, and flexural strength.

C. Concrete Admixtures ..... 4 Hours

Outcome: Describe concrete admixtures.

1. Define admixtures for concrete.
2. Identify admixtures, their uses and limitations.
3. Describe commonly used water reducing admixtures
4. Describe commonly used air entraining admixtures.
5. Describe commonly used accelerating admixtures.
6. Describe commonly used hardeners.

D. Concrete Toppings and Grouts ..... 2 Hours

Outcome: Describe concrete toppings and grouts.

1. Describe where and how topping finishes are used and applied.
2. Identify the basic composition of cementitious grouts and mortars.
3. Describe the application of cementitious grouts and mortars.
4. Describe patching and bonding materials.
5. Describe the composition and application of epoxy and polyurethane grouts.

E. Concrete Repair ..... 3 Hours

Outcome: Describe concrete repair.

1. Identify types of (Installation and Stress) defects such as scaling, spalling, crazing and honeycombs.
2. Determine the cause of defects such as stress, efflorescence and improper placing or finishing.
3. Describe the procedures to remove defects with abrading tools.
4. Describe the procedures to prepare a surface with bonding agents such as latex modified, slurry mix and epoxy.
5. Develop the ability to apply a new finish.

F. **Precast Concrete** ..... **2 Hours**

Outcome: ***Describe precast concrete.***

1. Compare post-tensioned and pre-tensioned precast members.
2. Describe tilt up panels.

SECTION FIVE: .....CONCRETE FINISHING AND CURING..... 18 HOURS

A. **Advanced Concrete Placing and Finishing** ..... **15 Hours**

Outcome: ***Complete a Concrete Project***

1. Finish a coloured slab with a stamped surface pattern.
2. Apply a coloured hardener using the dry shake method.
3. Use the water washing and brushing method to achieve an exposed aggregate finish.
4. Use the seeding method to achieve an exposed aggregate finish.
5. Patch and repair concrete curb.

B. **Hot and Cold Weather Curing** ..... **3 Hours**

Outcome: ***Describe hot and cold weather curing.***

1. Explain cold weather curing procedures as per CSA specifications.
2. Explain hot weather curing procedures as per CSA specifications.

SECTION SIX:.....ADVANCED MATHEMATIC CALCULATIONS..... 12 HOURS

A. **Related Calculations** ..... **12 Hours**

Outcome: ***Solve calculation problems.***

1. Solve problems using arithmetic concepts.
2. Solve problems relating to percentage.
3. Solve problems relating to ratio and proportion.
4. Solve problems relating to perimeters areas and volumes.
5. Solve problems relating to the Pythagorean Theorem.
6. Calculate foundation concrete volumes.

SECTION SEVEN: ..... COMMERCIAL DRAWING INTERPRETATION ..... 18 HOURS

A. **Commercial Drawing Interpretation**..... **18 Hours**

Outcome: ***Interpret commercial drawings.***

1. Interpret a set of drawings and specifications of a commercial building.
2. Identify all information related to the Concrete Finisher trade.
3. Identify all information not related to the Concrete Finisher trade.
4. Describe alphabet of lines.

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